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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,770	02/02/2001	Yuji Isoda	Q62998	6816

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EXAMINER	
LEE, SHUN K	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 07/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/773,770	ISODA ET AL.	
	Examiner	Art Unit	
	Shun Lee	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sieber *et al.* (US 5,391,884) in view of Huston *et al.* (US 6,087,666).

In regard to claims **1**, **3**, **7**, and **9**, Sieber *et al.* disclose a method comprising applying (column 5, lines 1-25) a target radiation or ultraviolet rays (column 5, lines 37-39) to a means containing a terbium-samarium co-activated alkaline earth metal rare earth oxide phosphor which is composed of an oxygen atom and is a composition of the formula (I): $BaGd_2$: yTb, zSm, in which y and z are numbers satisfying the conditions of $0<y\leq 0.1$ and $0<z\leq 0.1$, respectively (column 3, line 25 to column 4, line 18), to cause the

phosphor to emit (column 6, lines 36-42) a light (*e.g.*, green light at about 550 nm; Fig. 3). The method of Sieber *et al.* lacks measuring a light strength variation per unit time. Huston *et al.* teach (column 3, lines 1-7) that phosphors scintillate when exposed to ionizing radiation (*e.g.*, x-rays or ultraviolet rays) which advantageously permit real-time monitoring of ionizing radiation. Inherent in real time monitoring is measurement as a function of time (see Fig. 4 of Huston *et al.*). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to measure the light strength variation per unit time in the method of Sieber *et al.*, in order to perform real-time monitoring of the ionizing radiation as taught by Huston *et al.*

In regard to claim **2** (which is dependent on claim 1) and claim **8** (which is dependent on claim 7), Sieber *et al.* also disclose (column 5, lines 1-5) that the means is in the form of a sheet which comprises a support and a phosphor layer containing the phosphor.

In regard to claims **5** and **6**, Sieber *et al.* in view of Huston *et al.* is applied as in claims 1 and 3 above. Sieber *et al.* also disclose a method of producing a radiation image with a radiation image storage panel (comprising the phosphor) that comprises the steps of: determining (column 5, lines 25-30) the light strength in each pixel which is imaginarily set on the storage panel, to obtain two-dimensional image data; and producing (column 5, lines 30-36) a radiation image from the obtained image data.

4. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sieber *et al.* (US 5,391,884) in view of Huston *et al.* (US 6,087,666) as applied to claims 1 and 7 above, and further in view of Kastner *et al.* (US 3,412,248).

In regard to claim **4** (which is dependent on claim 1) and claim **10** (which is dependent on claim 7), Sieber *et al.* also disclose (column 1, lines 29-36; column 5, lines 37-39) that the radiation is ionizing radiation such as X-rays or Gamma rays or ultraviolet radiation. The modified method of Sieber *et al.* lacks the step of preparing a calibration curve by applying a standard target radiation (*e.g.*, ultraviolet rays) in a known dose. However, calibration is well known in the art. For example, Kastner *et al.* teach (column 3, lines 45-53) that calibration charts are made for exposure of the dosimeter to known amounts of radiation in order to give measurement of the radiation to which the dosimeter is exposed. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to apply a standard target radiation (*e.g.*, ultraviolet rays) in a known dose in the modified method of Sieber *et al.*, in order to prepare a calibration curve so as to determine the radiation amounts to which the means (*e.g.*, dosimeter) is exposed.

5. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sieber *et al.* (US 5,391,884) in view of Dewaele (US 5,832,055), Arakawa (US 5,051,589), and Brixner (US 4,608,190).

In regard to claims **11** and **13**, Sieber *et al.* disclose a method comprising the steps of:

(a) applying (column 5, lines 1-25) a target radiation to a dosimeter containing a terbium-samarium co-activated alkaline earth metal rare earth oxide phosphor which is composed of an oxygen atom and a composition of the formula (I): $BaGd_2$: yTb, zSm, in which y and z are numbers satisfying the conditions of

$0<y\leq 0.1$ and $0<z\leq 0.1$, respectively (column 3, line 25 to column 4, line 18), so as excite the terbium-samarium co-activated phosphor (column 5, lines 1-36);

(b) applying (column 5, lines 25-30) stimulating radiation (*e.g.*, ultraviolet rays) to the dosimeter to which the target radiation has been applied, to cause the phosphor to emit a stimulated emission; and

(c) measuring (column 5, lines 25-30) the stimulated emission (*i.e.*, target radiation measurement).

While Sieber *et al.* disclose interaction of target radiation with the terbium-samarium co-activated phosphor, the method of Sieber *et al.* lacks an explicit description that the interaction of target radiation with the terbium-samarium co-activated phosphor comprises variation of terbium and samarium atomic valency. However, the interaction of target radiation with phosphors is well known in the art. For example, Brixner teach (column 4, lines 25-47) that interaction of target radiation with (*i.e.*, excitation of) a phosphor comprises charge (*e.g.*, an electron) trapping by activators. It should be noted that valency is defined[1] as "the combining capacity of an atom or a radical determined by the number of electrons that it will lose, add, or share when it reacts with other atoms or a positive or negative integer used to represent this capacity". Thus charges (*e.g.*, an electron) trapped by an activator A when target radiation interacts with a phosphor changes the activator atomic valency (*e.g.*, A^{+3} to A^{+2}). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the interaction of target radiation with (*i.e.*, excitation of) the phosphor in the method of

Sieber *et al.* inherently comprises charge trapping by activators (*i.e.*, variation of terbium and samarium atomic valency).

In addition while Sieber *et al.* disclose a target radiation measurement, the method of Sieber *et al.* lacks a step of comparing the target radiation measurement which is a (*i.e.*, second) green and red light strength measurement to an initial (*i.e.*, first) ultraviolet rays stimulated emission obtained before target radiation application. Arakawa teaches (column 3, line 62 to column 4, line 2) that a single stimulable phosphor sheet capable of emitting light having different wavelengths allow novel energy subtracting processes. Further, Dewaele teach (column 6, lines 22-26) to determine a calibration matrix (which is required to correct for defects in a stimulable phosphor sheet; column 2, lines 5-36; column 3, lines 36-53) before every exposure for extreme accuracy. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to determine a calibration matrix by an initial ultraviolet rays stimulated emission measurement before every target radiation application in the method of Sieber *et al.*, in order to enhance accuracy by comparing the target radiation measurement with the calibration matrix and wherein the target radiation measurement and the calibration matrix determination comprises multiple (*e.g.*, green and red) wavelengths measurements so as to perform the energy subtracting (*i.e.*, comparing) processes with multiple wavelengths taught by Arakawa.

In regard to claim **12** which is dependent on claim 11, Sieber *et al.* is applied as in claims 2 and 8 above.

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[1] The American Heritage® Dictionary of the English Language, Third Edition copyright © 1992 by

In regard to claim **14**, Sieber *et al.* in view of Dewaele and Arakawa is applied as in claims 11 and 13 above. Sieber *et al.* also disclose a method of producing a radiation image from a radiation image storage panel (comprising the phosphor) that comprises the steps of: determining (column 5, lines 25-30) the emission in each pixel to obtain two-dimensional image data; and processing (column 5, lines 30-36) the two-dimensional image data for producing a radiation image from the obtained image data.

Response to Arguments

6. Applicant's arguments filed 18 February 2004 have been fully considered but they are not persuasive.

In response to applicant's argument (last two paragraphs on pg. 2 of remarks filed 18 February 2004) that the OSL glasses described in Huston *et al.* are not directly comparable to terbium-samarium co-activated alkaline earth metal rare earth phosphors, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, Huston *et al.* state (column 3, lines 1-7) that "Because they are phosphors, the OSL glasses described above also scintillate when exposed to ionizing radiation. This scintillation advantageously permits the present

invention to also serve as a real-time monitor of ionizing radiation". Thus, Huston *et al.* teach that phosphors scintillate when exposed to ionizing radiation (*e.g.*, x-rays or ultraviolet rays; see column 1, lines 21-23) and that the scintillation from phosphors advantageously permit real-time monitoring of ionizing radiation. Inherent in real time monitoring is measurement as a function of time (see Fig. 4 of Huston *et al.*). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to measure the light strength variation per unit time in the method of Sieber *et al.*, in order to perform real-time monitoring of the ionizing radiation as taught by Huston *et al.*

Applicant argues (pg. 3 of remarks filed 18 February 2004) that real time monitoring is performed to continuously or intermittently measure a certain phenomenon just when the phenomenon occurs and does not always measure a variation of the phenomenon. Examiner respectfully disagrees since real time monitoring as exemplified by Fig. 4 of Huston *et al.* clearly shows measurement (of scintillation signal) as a function of time in order to obtain real time monitoring. Thus, real time monitoring is not performed to measure a certain phenomenon just when the phenomenon occurs.

Applicant argues (first paragraph on pg. 4 to first three paragraphs on pg. 5 of remarks filed 18 February 2004) that there is no reasonable expectation of success since the time-dependent variable emission of the green light of the terbium-samarium co-activated alkaline earth metal rare earth phosphor was not known in the art when the invention was made. Examiner respectfully disagrees. First, no evidence has been

supplied to support the assertion that the time-dependence of phosphor emission is unknown in the art at the time of the invention. Second, Sieber *et al.* state (column 6, lines 36-42) that "While the phosphors can be employed for their prompt emission following exposure to X-radiation, they are more preferably employed as storage phosphors that is, for their ability to emit electromagnetic radiation in a chosen wavelength range after being exposed to X-radiation and then stimulated by exposure to radiation in a third spectral region". Thus, Sieber *et al.* teach that phosphors scintillate when exposed to ionizing radiation. Implicit in the prompt emission and/or stimulated emission in the phosphor of Sieber *et al.* is a time varying phosphor prompt and/or stimulated emission (*i.e.*, the prompt and stimulated emission results from an ionizing radiation exposure of a predetermined duration). Finally as discussed above, Huston *et al.* teach that these scintillation from phosphors advantageously permit real-time monitoring of ionizing radiation. Thus there is a reasonable expectation of success that the prompt emission (*i.e.*, scintillation) from the phosphor of Sieber *et al.* following exposure to X-radiation (*i.e.*, ionizing radiation) permit real-time monitoring of X-radiation (*i.e.*, ionizing radiation). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to measure the light strength variation per unit time in the method of Sieber *et al.*, in order to perform real-time monitoring of the X-radiation (*i.e.*, ionizing radiation) as taught by Huston *et al.*

In response to applicant's argument (first paragraph on pg. 6 of remarks filed 18 February 2004) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, utilizing a

spontaneous emission that is produced upon application of the radiation to be measured) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument (second paragraph on pg. 6 of remarks filed 18 February 2004) that there is no reasonable expectation of success since Dewaele, Arakawa, and Brixner are each silent with respect to the terbium-samarium co-activated alkaline earth metal rare earth oxide phosphor, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, Arakawa teaches (column 3, line 62 to column 4, line 2) that a single stimulable phosphor sheet capable of emitting light having different wavelengths allow novel energy subtracting processes. Further, Dewaele teach (column 6, lines 22-26) to determine a calibration matrix (which is required to correct for defects in a stimulable phosphor sheet; column 2, lines 5-36; column 3, lines 36-53) before every exposure for extreme accuracy. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to determine a calibration matrix by an initial ultraviolet rays stimulated emission measurement before every target radiation application in the method of Sieber *et al.*, in order to enhance accuracy by comparing the target radiation measurement with the

calibration matrix and wherein the target radiation measurement and the calibration matrix determination comprises multiple (*e.g.*, green and red) wavelengths measurements so as to perform the energy subtracting (*i.e.*, comparing) processes with multiple wavelengths taught by Arakawa.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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